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Notes Concerning Abortion, Mastitis and Sterility*

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This afternoon I propose to speak about contagious abortion, and mastitis caused by or associated with the presence of *Str. agalac'iae* in the udder, and finally I shall touch on another condition, namely, sterility of cattle associated with a *C. pyogenes* infection of the uterus.

I shall endeavour to avoid the reiteration of what are well-known facts; rather would I bring to your attention some of the more important gaps in our knowledge and perhaps indicate some directions in which further investigations should be made.

Contagious Abortion

In this island there is no definite and reliable information on the general incidence of contagious abortion nor is it safe to assume that the estimates that have been made on the relationship of *Br. abortus* to sterility are approximately correct.

The Report on Diseases of Farm Stock, prepared by the Survey Committee of the National Veterinary Medical Association, assesses the abortions and premature calvings caused by the disease at 10 per cent. of all pregnancies. It should be remembered that all attempts to assess the extent of the disease have had to be made on the very limited and incomplete information supplied by those who have had no opportunity of making a general survey of the disease, even throughout a district of moderate size. Furthermore, the information supplied to committees by persons who have specialised on a disease will tend to over-emphasise the importance of that disease, as it is a common failing to exaggerate the significance of the subjects that engage our particular attention.

The most impartial record that I know which gives the incidence of abortion is provided by Lovell and Bradford Hill, who summarised the information supplied from records collected by official milk recorders on the mortality among calves in 315 herds in England and Wales. Stillbirths and abortions from all causes in these herds amounted to 9·9 per cent. of all pregnancies. The figures recently collected at my laboratory from animals from which a reliable breeding history was available and which were blood tested are shown in the following table :—

Abortions expressed as a percentage of the pregnancies completed immediately prior to the animals being tested by the serum agglutination test

		Negative reactors that aborted	Doubtful reactors that aborted	Positive reactors that aborted	Total abortions
Number of pregnancies in cows	4,293	3·3	1·2	12·9	17·4
Number of first pregnancies (first-calf heifers)	1,801	2·1	0·3	6·3	8·7

The figures for abortion that I have given are appreciably higher than those of the Survey Committee's Report, but it should be emphasised that my figures are taken from herds where the veterinary surgeons and the owners were perturbed by contagious abortion or the possibility of contagious abortion appearing in the herds and contemplated undertaking measures of control which would put them to some trouble and effort. The figures are from selected and not representative herds and therefore may tend to exaggerate the losses caused by the disease.

We are about to enter a period in which vaccination will be more widely advocated and practised than ever before and when, it is to be hoped, standard and uniform methods of vaccination will be used. It seems a pity to embark on the very general use of vaccine without knowing more precisely what the incidence of the unchecked disease is. A survey of the incidence of the disease in a sufficient number of representative herds, selected at random throughout the country, is required. The information on the way in which each animal's last-completed pregnancy ended, together with the result of the agglutination test on blood samples from individual cattle, would supply the required data and it should be a simple matter for the Animal Health Division to collect this information.

To assess the value of vaccination against contagious abortion by following the happenings in a number of vaccinated herds is not easy. The obvious way in which to assess the value of vaccination in the field is to record the incidence of infection and the course the disease runs in a number of vaccinated animals and to compare this information with similar information collected from a sufficient number of non-vaccinated control animals. In contagious abortion field trials it is very difficult to keep control animals. This difficulty will not be lessened by an officially sponsored scheme of vaccination which, at the very least, implies that vaccination is beneficial. If the benefits of vaccination are to be withheld from certain cattle, the farmer will have to be compensated for any control animals. This at once raises administrative difficulties which are disliked. If these difficulties are overcome and control animals are to be kept, should the animals, as they enter the experiment, be young unserved heifers only or should older stock be included? As it is desirable to protect both the young and the older animals by vaccination, it would be a pity not to include the latter in the experiment. Cows in lightly infected herds may not supply much information and it would be preferable to have the vaccinated and control cattle in the more heavily infected herds. In any herd there is no point in vaccinating the infected animals, indeed their vaccination is always a risk as abortions occurring among them may quite incorrectly be attributed to the vaccine. It will therefore be advisable to confine the vaccinated and control animals to those cows that were non-reactors to the agglutination test when they entered the experiment. This would straightway cut down the number of cattle that could be used to about 60 per cent. of those in suitable, infected herds. If equal numbers of controls and vaccinated animals were to be kept, only 30 per cent. of the cows would be left for vaccination. The vaccination of the animals will have to be spread over nearly twelve months so long as pregnant animals cannot be vaccinated. During those twelve months some of the cattle will react to the agglutination test before they can be vaccinated or before they should enter the experiment as actual controls to animals vaccinated, and all such animals should be excluded from the experiment. Accordingly the number of vaccinated and control animals will be still further depleted. Therefore, it is clear that, having decided upon the number of vaccinated and control cattle that should make a satisfactory trial, herds with at least twice that number of cows will have to be found. For example, if we wished to collect information from 5,000 vaccinated cows and 5,000 controls, we should have to start with at least 20,000 cows in our infected herds. This 20,000 makes no allowance for sterility, deaths or sales reducing the numbers of experimental cattle. It would be most desirable to follow the vaccinated and control cattle through at least two pregnancies and if we wished to have 5,000 animals in each group at the end of a second pregnancy it would be advisable to work with herds containing 40,000 cows in all when we began our field trial.

Should our field trial be extended to young heifers, then it must be remembered that these animals are to a greater or lesser degree protected from exposure to infection until they have calved and entered the general herd, and to get results from vaccination trials on heifers it would be most advisable to follow the animals through to the completion of a second pregnancy. If we wanted to have results from the second pregnancy of 5,000 vaccinated and 5,000 control heifers that had entered the experiment as virgin animals and we were to make adequate allowance for animals being lost as the experiment proceeded, a very considerable number of herds, whose owners were willing to keep control animals for a period of at least two and a-half years, would have to be found.

When the Survey Committee's recommendations, as adopted by the Animal Health Division, come into operation, it is most probable

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that vaccination will be extended to cows and heifers. The veterinary practitioner should have an appreciation of certain risks that will be taken when he vaccinates cows. There is to be no general scheme of blood testing and both reacting and non-reacting animals will be vaccinated. I believe infected cattle will suffer no harm from vaccination but there is no reason to think that vaccination will benefit them. However, if a number of infected animals are vaccinated and some of them abort, the vaccine will almost certainly be blamed. The number of abortions among vaccinated animals would be reduced if vaccination were confined to non-reacting cattle, but even then some animals will be infected, although non-reactors, and some of them will abort. A number of abortions due to Brucella infection among this class of stock must be regarded as unavoidable.

Unfortunately, still further abortions must be expected, namely, those not caused by Brucella infection. If the vaccine produces a positive agglutination reaction, it will be impossible to distinguish non-specific abortions from those caused by Brucella infection and the vaccine may be incorrectly blamed for infecting the animals and causing abortion.

The risks I have sketched are real. Some of them are avoidable, but will those that are avoidable be avoided?

The general vaccination of cows may very readily, though quite undeservedly, become discredited. There are, of course, similar risks in the vaccination of heifers but to a lesser degree for the simple reason that the extent of Brucella infection and other infections of the genital tract is lower in heifers than in cows.

The belief that living abortion vaccine causes sterility is firmly held by some farmers and not a few veterinary surgeons are of the same opinion. It is almost certain that, as vaccination becomes more general, it will be blamed repeatedly for causing sterility. It will be very difficult to refute accusations until it has been shown that there is no more sterility among vaccinated herds than there is among infected non-vaccinated herds and that, in the same herd, the non-infected vaccinated cattle suffer no more but possibly less from sterility than do the infected non-vaccinated animals. It is time this question of vaccination against contagious abortion causing sterility was decided by evidence from the field. Here again is another problem of field research for the Animal Health Division.

It follows from what has been said that adequately conducted field trials are necessary before any general scheme of vaccination, no matter how good it may be, should be applied.

Until recently it was a common belief that cattle did not develop any satisfactory immunity to contagious abortion. This view has now given place to a more general faith in the usefulness of vaccination, which is founded on a still very limited use of living vaccines of reduced virulence.

When cattle were inoculated with virulent cultures, some animals were permanently infected by vaccination and probably these vaccination infections, the true nature of which was not recognised, gave rise to the belief that animals did not develop a satisfactory degree of immunity. Experiments have shown that the immunity of vaccinated animals increases with the virulence of the vaccine. The immediate practical solution of the problem of vaccination with living cultures is the use of the most virulent vaccine which, of itself, does not cause infection, or which causes infection only in a very small percentage of animals. Attempts have been made to fulfil these conditions and the best known are the experiments with the American Strain 19 and the experiments in this country with Strain 45 (20). Both strains are of greatly reduced virulence. The former is smooth and, in consequence, animals inoculated with vaccine prepared from it react positively to the agglutination test. Strain 45 (20) is rough and the inoculation of this strain into animals does not give rise to any reactions to the agglutination test.

In America, owing to the test and slaughter policy, it was necessary to use a vaccine or a method of vaccination that would not cause sexually adult animals to react to the agglutination test. The difficulty was circumvented by vaccinating animals while they were calves and Strain 19 is being increasingly used for this purpose.

It is known that the great majority of calves, even when inoculated with a virulent strain of *Br. abortus*, overcome the infection and cease to react to the agglutination test by the time they are old enough to breed.

As the accumulating evidence shows that the more virulent the vaccine the better the immunity response, it is probable that further work will show that a vaccine prepared from a strain more virulent than Strain 19 would be preferable for the vaccination of calves.

The vaccination of calves with Strain 19 confers a demonstrable immunity to infection and, in the U.S.A., it has become popular partly for that reason and also because it has fitted in with the test and slaughter policy of that country. Unfortunately the popularity of this method of vaccination has given rise to the view that a better immunological response is obtained from the calf than from the older animal. There is no evidence whatsoever to support this belief.

It may be noted in passing that there are reports from America of less scrupulous owners vaccinating their older animals with Strain 19 in order to make the animals positive reactors to the agglutination test so that they might be taken under the test and slaughter policy and the owners receive compensation for them.

A most interesting feature of immunity to *Br. abortus* is the stimulation of immunity by rough strains of the organism. This is not in keeping with the usual expectations for an anti-bacterial immunity.

When an animal is inoculated with a killed culture of a bacillus or with a living culture of reduced virulence, antibodies may appear in its serum. It is believed that, in the immunised animal, the antibodies act on the bacteria that gain entrance to the tissues and by so doing bring into operation any bactericidal action the serum may possess and, what is probably more important, sensitise the bacteria so that they are readily taken up by phagocytic cells and, depending upon the species of the infecting organism, more or less effectively disposed of. In either case the antibodies are regarded as effective by virtue of the fact that they unite with, and only with, the antigens that stimulate their production. It is considered that these antigens, to be able to unite with the antibodies, must be situated on the surface of the bacterial cells.

Rough strains of bacteria may be regarded as degenerate bacteria that have lost their original surface antigens and therefore they will not be capable of stimulating the antibodies that must be present to unite with the surface antigen on normal virulent bacteria, if the animal is to enjoy the benefits of immunity. It follows that vaccines prepared from rough strains of bacteria should not be effective in stimulating an anti-bacterial immunity and this is generally true. *Br. abortus* does not behave in the expected manner, as rough strains immunise. Perhaps this is not so surprising in view of the poor immunity stimulated by ordinary killed vaccines of that organism. There is no knowledge on the mechanism of immunity to *Br. abortus*.

May I call your attention to the remarkably high resistance of infected animals to reinfection and also their sensitisation to reinfection. The reaction of the Brucella infected guinea-pig is analogous to the Koch's phenomenon in tuberculosis. When a culture of the tubercle bacillus is inoculated into the normal guinea-pig an ulcer occurs at the point of inoculation that never heals but persists until the animal dies from the disease, but if a tuberculous guinea-pig is inoculated subcutaneously there is a local reaction followed by an ulcer which rapidly heals; furthermore, the regional lymph glands do not become infected. The infected guinea-pig shows a considerable resistance to reinfection but the resistance is readily broken down by increasing the reinfecting dose of bacteria. The infected animal is, of course, sensitive to tuberculin.

The *Br. abortus* infected guinea-pig is capable of overcoming enormous doses of the bacteria of reinfection and if the animal is reinfected by the intraperitoneal inoculation of a sufficiently large dose, it will die within 24 hours. A similar dose of bacteria will cause no obvious illness in a normal guinea-pig. When the reinfecting dose is reduced, though it may still contain several million infective doses for the normal guinea-pig, the infected animal survives and, although its blood stream is heavily infected for a few days, the bacteria of reinfection are rapidly removed and after one week cannot even be demonstrated in the spleen. At the same time a violent cellular reaction occurs in the peritoneal cavity, particularly noticeable on the omentum and the mesentery. This local reaction in the peritoneal cavity is never observed in normal guinea-pigs.

Whether a further study of this phenomenon of immunity will throw some light on the mechanism of immunity to Brucella and the part played by the body cells, I dare not say.

It would not be so easy to carry out a reinfection experiment on cattle but if it were done it might provide a final answer to the question as to whether cattle ever abort a second time owing to a second infection. If the behaviour of the guinea-pig is a true guide to the behaviour of the cow it is probable that second abortions are due to a blood stream infection of the uterus and the susceptible foetal membranes from some focus of the original infection, and not to reinfection by a fresh infection.

Finally, before passing on from a consideration of contagious abortion problems, I should like to emphasise the need for continued investigation on improved methods of vaccination. If we continue to use live vaccine, I think it probable that, sooner or later, the manner of immunising cattle will consist in the inoculation of the calves with a vaccine prepared from a strain of normal virulence which will be followed after every calving by a further inoculation of a vaccine of reduced virulence. For very obvious reasons the latter vaccine should not stimulate the appearance of agglutinins.

Str. agalactiae Mastitis

If there is little exact information about the incidence of contagious abortion, there is still less about the incidence of mastitis associated with *Str. agalactiae* infection.

A great deal of very valuable work has been done on the identification of streptococci found in milk from diseased udders and, as a result, *Str. agalactiae* can be isolated with relative ease and identified with reasonable certainty.

The organism is of feeble pathogenicity and, as it does not produce any demonstrable toxin, there is little hope of an anti-toxic immunity playing any role in the control of the disease. An anti-bacterial immunity is, as a rule, much less effective than an anti-toxic immunity and an effective anti-bacterial immunity against *Str. agalactiae* has yet to be produced. Furthermore, if infection be generally confined to the milk cistern and the larger milk ducts, and this view is widely held, an anti-bacterial immunity, even if effective, might not prevent the organisms establishing themselves at those sites which are virtually outside the tissues and probably beyond the protective range of an immunity.

Probably a very large number of cattle are lightly infected with the *Str. agalactiae* and never show symptoms of clinical mastitis. These carrier animals present a great menace to all attempts to control the spread of the infection. It is known that the more exacting the bacteriological examination of milk samples the more udders will be found infected and when the percentage of non-infected cattle is small the incentive to apply laborious preventative measures naturally diminishes.

It has been seriously suggested that the lightly infected cattle be regarded as non-infected. In a recent paper by Campbell describing current and orthodox views on the control of the spread of the disease, the infections that might be disregarded were expressed as those which, on bacteriological examination of the milk, gave not more than 50 colonies per plate of culture medium. Presumably this was when the sediment from 10 c.c. of the fore-milk was inoculated into a blood agar plate. This method of examination is however not critical, and when used, many lightly infected animals will be missed.

It is impossible to believe that infection will not continue to spread while carriers remain in the herd and laborious precautions, such as the isolation of heavily infected cattle and clinical cases, adherence to a definite order of milking, disinfections and sterilisations, will probably be of little or no avail in the prevention of the spread of infection.

When clinically infected cows are removed from a herd and the animals heavily infected with *Str. agalactiae* are partially segregated and the ordinary precautions designed to prevent infection spreading are complied with, an apparent and indeed marked decrease in the number of cases of mastitis may follow. But it should be remembered that it is no uncommon thing to find very little clinical mastitis in infected herds where no precautions are taken. Furthermore, some clinicians claim to have controlled *Str. agalactiae* mastitis effectively without the help of laboratory examinations. Doubt may therefore be cast on the value of laboratory diagnosis in the control of this disease for the following reasons :—

1. The exclusion of all carriers from the herd would frequently so reduce the herd that a negligible number of non-infected cattle would be left.

2. There is still no definite proof that the disease may be more effectively controlled when laboratory examinations are made than by reliance on clinical examinations only.

The recommendations made by the Survey Committee of the N.V.M.A. go as far as is justifiable at the present time and they are based on clinical diagnosis only.

There will have to be a much more thorough and complete application of laboratory methods before we obtain a better understanding of mastitis associated with *Str. agalactiae* infection.

With regard to treatment, there is scope for improvement. A variety of substances infused into the udder appear to be beneficial, entozon, acriflavine, gramicidin and novoxil are perhaps the best known, but others have been used with some success. We are trying the effect of infusing products of the sulphonamide type directly into the udder in clinical cases and infusions of a soluble product, sulphonamide E.O.S., have given some promise of success.

Sterility Caused by *C. pyogenes* Infection

It is recognised that sterility associated with a *C. pyogenes* infection of the female genital tract does not yield readily to treatment. This form of sterility is by no means uncommon and it may assume most serious proportions in a herd.

I believe it is correct to say that nothing is known about the way infection is acquired and spread in a herd. The bull, of course, is suspected of spreading the infection. Abortions due to *C. pyogenes* infection appear to be rare and it is probable that the genital organs are more frequently infected after parturition than during pregnancy.

From the sporadic nature of *C. pyogenes* infections in general it might appear that infection shows little tendency to spread except under peculiarly favourable conditions when considerable numbers of animals in the same herd become infected. It is, however, probable that the infection is very widespread and that many animals are carriers but show no clinical symptoms until conditions operate which favour the appearance of clinical infection in a susceptible organ.

It has still to be shown that animals can be successfully immunised against the infection, but even if this were possible it still would be necessary to determine those conditions which come into operation and facilitate the spread of infection which manifests itself in clinical disease.

Experiments are therefore required to show whether the female genital organs are infected by way of the blood stream or more readily by the direct introduction of the bacteria into the genital tract.

The successful prevention of sterility due to *C. pyogenes* infection may depend upon the answers these experiments will furnish. It is possible that the veterinarian contributes to the spread of the disease when he examines an infected animal and then proceeds to the examination of the genital organs of non-infected cattle. If this possibility is a fact, then the adoption of the Survey Committee's plans for the treatment of sterility may lead to the infection of many animals which, if left to themselves, would breed again quite normally but which, if infected by *C. pyogenes* through the agency of human hands and instruments, become more or less permanently sterile.

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Discussion

Mr. T. A. R. Chipperfield opened the discussion by asking the questions and making the points which follow. (1) Is there any evidence that vaccination of already infected animals is detrimental? (2) If naturally infected animals are resistant to fresh infections why do local foci of infection persist? (3) He was of the opinion that secondary invaders caused some of the complications and that mixed, killed vaccines might be advocated. (4) Could attenuated vaccines, by "passage" through other cows, regain full virulence? (5) Is the vaccination of all non-pregnant non-reactors in infected herds advocated? (6) He wished to stress the necessity for thorough cleansing of the hands and instruments between each subject when handling for sterility.

Dr. McEwen, replying, said that he knew of no evidence that vaccination of infected animals was detrimental but there was no ground for believing that it was beneficial. He could not explain why animals with local foci of infection might be resistant to reinfection but there was indirect evidence to suggest that infected cattle were resistant to reinfection, and he had obtained experimental evidence that infected guinea-pigs were most resistant to re-infection. Any attenuated vaccine, if administered in such a manner and at such a time as to cause infection and abortion, might regain full virulence. He was collecting data from over 400 herds, in which the non-pregnant non-reacting cattle were vaccinated with a vaccine prepared from Strain 45 (20), which was of low virulence, and he believed this was a safe procedure and that the cattle were given an effective immunity.

Mr. Chipperfield subsequently described the case of a Guernsey bull reputed never to have served stock but was affected with preputial catarrh with ulceration; he was immediately returned to the vendor and was examined by an eminent veterinary surgeon, who said it was healthy. Mr. Chipperfield advocated better bull management and irrigation of the prepuce before and after service. He asked whether cases of bullburn are due to *C. pyogenes*.

Mr. H. T. Matthews raised the point of the ban on vaccination against brucella in tuberculin tested herds. This was a Ministry of Health regulation, and discussions were in progress between the two Ministries to arrive at some modification. The Ministry of Agriculture had no objection to vaccination in attested herds as such. (1) Regarding prohibition on account of danger of milk infection, he asked what chances were taken in vaccination with Strain 45 (20) or the American of causing excretion in milk and infection in humans? Would Dr. McEwen say categorically that it would not happen? (2) What was the latest information on intradermal test for brucellosis as advocated some time ago by Holtum? He thought *C. pyogenes* was so common in udders as to be almost a normal inhabitant. Were these different strains from those infecting the uterus and causing sterility, or from those responsible for a form of mastitis?

Dr. McEwen said, in reply, that suspensions of cultures and crude extracts of *Br. abortus* corrected for their nitrogen content had been used but the results were no better than those given by the agglutination test. He understood that certain purified extracts had been found to give good reactions but the inoculation of these extracts caused agglutinins to appear in the blood of non-infected animals. From personal experience he had no reason to believe that Strain 45 (20), when inoculated into non-pregnant, non-infected animals, was excreted in the milk. He could not answer the question with regard to the American Strain 19, but if the strain was no more virulent or less virulent than Strain 45 (20), it was unlikely it would be excreted in the milk when inoculated into non-pregnant animals. If, however, either or both of the strains were sometimes excreted in the milk in a low percentage of vaccinated cattle, that would not be a valid reason for withholding the use of vaccine prepared from either strain, provided it was shown that vaccination reduced the total number of infected cattle. So far as he knew, strains of *C. pyogenes* isolated from udders and from the infected uterus were similar.

Mr. Henry Taylor asked whether large scale experiments with Wye vaccine had given good results. He thought they had had good results so far, and they were using it somewhat extensively. Live vaccine was useful in heifers on some farms. His partner, Mr. Stuart, could tell them something of sterility due to

C. pyogenes. Mr. K. Stuart said that in one herd, 10 out of 30 animals were hopelessly sterile. Toxoid was being tried. The chief source of danger in the spread of infection was the farmer himself.

Mr. Scott Dunn added his thanks for the very excellent address. He remarked that the Minister of Agriculture had said that the Survey Scheme was held up because the type of abortus vaccine had not been determined. Owners wanted to know what was to be done and he would be glad to have a very definite assurance that they could go ahead with the vaccination policy. The vaccine would be blamed for anything which subsequently occurred. All kinds of things were erroneously attributed to whatever was done. Vaccination of dogs against distemper had been blamed for causing hysteria, but this was all nonsense.

Dr. McEwen could not give the answer to Mr. Scott Dunn's request for immediate direction on policy.

Mr. Pearce asked: (1) Why not use a vaccine of the *highest* virulence on calves as a routine policy? (2) Whereas controlled experiments should, and no doubt could, be made on a vaccine for use in adult cows, no vaccine would surely be put out for universal use by the Survey Committee till it has been proved safe and effective, when controls would no longer be necessary. (3) Has any vaccinated cow, negative to test at vaccination, ever been shown to excrete brucella in her milk?

Replying to Mr. Pearce's questions, Dr. McEwen said that the obvious vaccine for any animal was the most virulent one that did not cause infection in that animal. He knew of no good reason why a vaccine of reduced virulence should be regarded as the best for calves, when calves were known to be resistant to the inoculation of virulent strains of *Br. abortus*. With regard to the excretion of Brucella in the milk of vaccinated cows he was only qualified to speak about two vaccines he had worked with, namely, those prepared from Strain 45 and from Strain 45 (20). He had made many examinations of the milk from animals vaccinated with these strains, but provided the cattle were non-pregnant when vaccinated, he had not found that either of the strains appeared in the milk. It was, however, impossible to rule out a natural infection in animals from infected herds, even although they gave negative reactions to the agglutination test before vaccination, and in practice some infected cattle were bound to be vaccinated and at a later date *Br. abortus* would be found in their milk.

Lieut.-Colonel H. A. Reid expressed his gratitude to the Society for their hospitality and for the privilege of attending their meeting. Years ago in New Zealand vaccination against bovine contagious abortion had been tried. Suitable herds were selected and massive doses of virulent vaccine employed. There was the usual difficulty about controls and although the results accruing in the vaccinated herds were considered by those in charge to be satisfactory there was no doubt that they were open to criticism. The risk involved of conveying undulant fever to milk consumers had to be considered and in consequence this method of vaccination had yielded to the more recent practice of using vaccine prepared from more or less avirulent strains. Owners in New Zealand could have their herds blood-tested, thus enabling them to adopt certain precautionary measures. Dr. McEwen's diagrams and explanation concerning the mechanism of immunity were admirable and reminded him of Ehrlich's side-chain theory which at most amounted only to an ingenious working hypothesis. Truth is only relative and what was acceptable to-day might be rejected to-morrow. No one, in fact, as Dr. McEwen admitted, knew very much about immunity, either natural or acquired, and the reason why during epidemics 'the one is taken and the other left' still remained an enigma. He hoped the time would come when we should cease to combat infective disease with the aid of a hypodermic syringe, and progress to that end could only come through further study of the factors underlying natural immunity. Meanwhile we should have to be content with the weapons now available in our armoury. In every country devoted to intensive animal husbandry disease tended to increase for we could not flout natural law without in some way paying the penalty. Referring to mastitis, Colonel Reid said that in despair of finding any effective means of udder disinfection he had resorted with some success to a method originally suggested by Dr. Peters of Peoria, which consisted of vaporisation of ether into the udder by way of the teat canal. But although this process seemed to bring about a fairly rapid decline in the number of streptococci present in the milk secretion it could not be claimed as entirely satisfactory—indeed, in view of what Dr. McEwen had said regarding latency, who could decide with any degree of accuracy when recovery from mastitis was complete? With reference to the danger of transmitting infection, including *C. pyogenes*, when handling stock, Colonel Reid underlined the importance of wearing rubber gloves rather than reliance upon the doubtful expedient of disinfection. Gloves, he thought, should be worn far more frequently by practising veterinary surgeons than was generally done.

Sir John Kelland said that it had been a privilege to attend. The address was an inspiration and we could be proud of the scientific men among us. In 1934 he visited U.S.A. and met that great veterinarian, Dr. John Mohler, Chief of the Bureau of Animal Industry, also many of his colleagues. He was enormously impressed with what he saw of that great organisation and formed the opinion that the work done by the Bureau was as good as was possible anywhere. He was privileged to meet Drs. Cotton and Buck, who had done such sterling work on brucellosis. Recently, through the courtesy of Dr. Mohler, he had received a publication dated January, 1941, by Mohler, Wright and O'Rear, entitled "Calfhood Vaccination as an Aid in Co-operative Bang's Disease Control." This showed that an extensive field trial experiment by the use of an attenuated virulent strain was started in 1936, using over 260 infected herds spread over 24 states. In these herds between 1936 and the end of 1940 no less than 17,000 calves between the ages of five and seven months had been vaccinated. The results recorded in the paper showed that of the calves vaccinated 8,182 had calved, involving three pregnancies, 5,673 first, 2,026 second and 483 third. There were 7,872, or 96·2 per cent., normal parturitions and 310, or 3·8 per cent., abortions, but post-parturition blood agglutination tests applied in the case of these 310 animals showed that 182 were negative and that only 128 abortions, or 1·6 per cent. of the 8,182 vaccinated animals, could be attributed to brucellosis. This Sir John thought was a remarkable result and, in his opinion, clearly indicated the line upon which progress could be looked for in dealing with this disease on a national basis. In his view, the whole article should be widely studied by members of the profession. In reply to queries by Dr. McEwen, Sir John pointed out that the article showed that in selecting the herds before the commencement of the experiment the application of the agglutination tests showed that the herds contained 5,531, or 29·2 per cent., positive reactors and 1,593, or 8·4 per cent., suspected. It showed, further, that the usual sanitary practices employed in disease control and eradication were not applied in these herds and that the only attempt at the control and eradication of disease was by means of the calfhood vaccination.

Dr. McEwen said that we owed a tremendous debt to the American workers already mentioned, and he would add the name of Huddleston. They had persisted with great courage and had kept alive the torch of vaccination.

In reply to Mr. D. N. Willett, who inquired if he could say what proportion of calves from infected cows were infected and whether these calves developed any immunity, Dr. McEwen said that the percentage of permanently infected calves from infected cows, if any, must be very small. From the success claimed for calfhood vaccination, it might be expected that calves from infected cows would be immune to the disease later in life, but field evidence indicated that this was not the case. Workers at the Bureau of Animal Industry, Washington, had sometimes used calves from infected cows in their experiments on calfhood vaccination and drawn conclusions from the results obtained from such animals.

CLINICAL COMMUNICATIONS

Cases of Foreign Body in the Alimentary Tract of Horses

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Agricultural Department, Maseru, Basutoland, S. Africa

I was deeply interested in Mr. G. S. Allen's clinical communication appearing in your issue dated December 13th, 1941, on the subject of a foreign body found in the intestinal tract of a Shire mare. I have records of such cases in Basuto ponies.

Case No. 1.—A registered troop pony, property of an African member of the Basutoland Mounted Police. The pony was taken ill with colic and the usual treatment carried out, *viz.*, (*a*) intravenous infusion of chloral hydrate; (*b*) physic ball. As the colic persisted it was given, 12 hours later, a dose of ol. lini. and tinct. opii per stomach tube. Twelve hours later the animal died. *Post-mortem* examination revealed a safety pin 10 cm. long, the business end of which was found impaled in the wall of the stomach. I suspected foul play in this case but could not prove or disprove my theory that the safety pin had been administered in a gelatine capsule (No. 10) by means of a balling gun.

Case No. 2.—A Government owned pack pony. The pony was reported ill with colic and the animal was dosed as in case No. 1. Death followed in about 12 hours. *Post-mortem* examination revealed a jagged piece of ironstone jammed in the small intestine causing its occlusion. This pony had been in the habit of frequenting ash heaps and rubbish dumps and evidently suffered from "pica".

Case No. 3.—Same history and treatment as No. 1. *Post-mortem* examination revealed a localised peritonitis caused by the blade of a penknife which had punctured the duodenum. This pony, also, had been in the habit of frequenting ash heaps, etc.

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4:4′ Diamidino Diphenyl Ether (M & B 736) in Canine Babesiasis

J. CARMICHAEL, D.Sc., M.R.C.V.S., Dip.Bact. (London),
Veterinary Research Laboratory, Entebbe, Uganda

The first work on the action of the aromatic diamidines on *Babesia canis* infection was carried out by Lourie and Warrington Yorke (1939), and they found that most of the compounds they examined had a definite action on *Babesia canis* infection in puppies but that diamidino diphenyl ether was much less toxic and in a dose of 10 mgm. per kilo cured all five of the puppies under experiment.

The object of this note is to record that these early experimental observations have been amply cofirmed in natural cases of tick fever in dogs in Uganda.

The compound has been used in 25 successive unselected cases with completely satisfactory results in that there was no toxic reaction following the administration of the drug and there were no deaths or relapses in the dogs treated. These included several very advanced cases and one which was showing haemoglobinuria and collapse.

Dosage and Method of Administration.—The dose used is 10 mgm. per kilo body weight. Owing to the fact that *Babesia canis* can readily be made resistant to these aromatic diamidines, it is important to have adequate initial dosage. Diamidino diphenyl ether is readily soluble in distilled water forming a stable solution, and this is made up in rubber capped sterile bottles of 25 c.c. in a concentration of 10 mgm. in 0·5 c.c. The solution is injected subcutaneously and in this strength appears to be non-irritant. In very large dogs the dose can be divided over two injections so as to ensure rapid and complete absorption.

The blood is negative in 12 to 24 hours and the temperature usually returns to normal within this period. Clinical improvement is rapid and uninterrupted, but in cases where anaemia is very marked haematinic treatment for a few days following the specific therapy is indicated.

Diamidino diphenyl ether is excellent in every way in the treatment of tick fever in dogs and its main advantages are its specificity and therapeutic efficiency in a single dose, the absence of undesirable reactions and its low toxicity. In this respect it is a great advance on other preparations used in the treatment of *Babesia canis* in dogs.

Reference

Lourie, E. M., and Warrington Yorke. (1939.) *Ann. Trop. Med. and Paras.* **33.** 305-312.

Weekly Wisdom

". . . it is clearly undesirable that any medical practitioner should be preaching and teaching a method . . . which involves the use of products, profits from the sale of which contribute substantially to his or her salary."—British Medical Journal (Annotation). 1942, March 14th, p. 365.

ABSTRACTS

[THE RELATIONSHIP OF METHODS OF BACTERIAL EXAMINATIONS TO THE ERADICATION AND CONTROL OF MASTITIS (*STREPTOCOCCUS AGALACTIAE*). Mattick, A. T. R., Shattock, P. M. F., and Jacob, M. M. (1941.) *J. Dairy Res.* **12**. 139-154. (27 refs.).]

The authors state that the majority of workers on mastitis are now convinced of the impossibility of eradicating the disease by segregating cows shown to be harbouring *Str. agalactiae*. Evidence is brought forward to show that at least one of the reasons for failure is the inaccuracy of the bacteriological methods employed. Examination of milk samples over varying periods from five herds was carried out by the usual bacteriological tests, infected animals being segregated, tests then being repeated together with an enrichment method for comparison. This method (a modified Hotis) consisted essentially in incubating milk samples mixed with a small concentration of brom-cresol purple 24 hours or more and then streaking on Edwards' medium (aesculin crystal violet blood agar), the object being to increase the number of streptococci in the milk before culturing them on solid medium. In all cases the method showed many more milks to be infected. Thus in a herd examined at *irregular* intervals by Edwards' technique over a period of 18 months and then tested by both methods, Edwards' method gave five positive and the enrichment 71 positive out of 177. In the case of a herd which had been tested *monthly for eight months* by Edwards' technique and then tested as before, the results were two positive by Edwards' method and 14 by the enrichment method out of 121. The smaller proportion of positives in this latter herd shows that inaccuracy in the method of examination is of less importance if tests are performed frequently. The authors show that in the case of milks, positive by the enrichment technique and negative by Edwards', *Str. agalactiae* is present in numbers of the order of 100 per c.c. and they also show that the enrichment method itself may fail to show small numbers of streptococci. The persistence of light infections over long periods is demonstrated by testing, over more than two years in some cases, a herd recruited from positive animals.

In the five herds considered no calved heifer was allowed to join the cows until her milk had been shown to be free from *Str. agalactiae* by Edwards' method. Seventeen first calvers out of 377 gave positive results when tested before joining the herd and 64 during the first lactation. Had the enrichment method been used, the number of positives would have been greater. These results show that more attention should be directed to the sources of calfhood infection, especially milk.

The authors consider that, though eradication is not feasible due to the inadequacy of bacteriological methods and to ignorance of the ways by which the disease spreads, regular tests and segregation reduce the incidence of clinical mastitis. Further, the usefulness of an inaccurate test depends on the frequency with which it is applied.

A. W. G.

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[ACUTE HYPOGLYCAEMIA IN NEWLY-BORN PIGS. Graham, R., Sampson, J., and Hester, H. R. (1941.) *Proc. Soc. Exp. Biol.* **47**. 338-339.]

A disease known arbitrarily as baby pig disease has been brought to the notice of the Illinois Agricultural Experiment Station during the past eight years. The disease is highly fatal and occurs on widely separated farms. A limited number of herds have been inspected and as far as can be determined the rations fed to the sows were adequate.

The syndrome is described as characteristic. Newly born pigs, though apparently normal, suddenly develop symptoms approximately 24–48 hours after birth. The piglets shiver and are dull, emitting a weak, crying squeal, the appetite is lost, the pig becomes weak and lapses into coma. Death occurs in from 24–36 hours. The losses vary from 5–95 per cent. of the pigs farrowed in various herds.

No gross pathological lesions were found on *post-mortem* examination. Bacteriological investigations proved negative, as also did transmission experiments.

Biochemical examination of the blood showed calcium, inorganic phosphorus and ketone contents to be normal. The blood sugar, however, was consistently abnormal. The blood sugar of normal piglets of the same age is stated to range from 99 to 131 mg. per 100 c.c. of blood. In affected pigs the range was found to be from 3 to 61 mg. of sugar per 100 c.c. of blood. One series of 20 affected piglets gave an average of 26 mg. of sugar per 100 c.c. of blood. A possible prenatal influence is postulated as the cause but it is admitted that the nature of this influence is unknown. Repeated injections of dextrose, together with forced feeding of milk, prolonged the life of affected piglets, and in some cases a recovery ensued. Therapy on these lines proved ineffective in the later stages of the disease.

G. F. B.

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[THE SELECTION AND TESTING FOR SOUNDNESS OF HORSES DISCHARGED FROM HORSE HOSPITALS AT HOME. Müller. (1941.) *Z. Vet.-Kunde.* **53**. 168-175.]

Home horse hospitals exist for the main purpose of returning the maximum number of horses to army work and they are taken in for treatment and treated with this object alone. Thus old sick horses are cast even though they might be fairly well cured.

During the 1939–40 period the author's hospital received a great number of horses which were simply exhausted, many being old. It was found unprofitable to try and make such 13–15-year-old draught horses serviceable again, as their tissues are incapable of regenerating. It should also be remembered that the dry army rationing system demands a high health level to begin with and its continuance.

Horses of "warm blood" and thoroughbreds can be kept in service to a greater age than draught breeds, even at ages of 18–20 years. Another important point made is the need for a good standard of horsemanship by troops mounted on the finer breeds of horse. The selection of horses should be done always with regard to the skill of the troops destined to ride them. It is also a matter of difficulty to compose good horse teams for gun or waggon haulage.

Diseases rendering horses unfit for further army service include laminitis, broken wind, certain chronic lamenesses (neurectomy is no help, except when limited to low volar nerve branches), navicular disease, ringbone of the fore legs and cured cases of fistulous withers, at least as riding horses. [It appears that the German standard army saddle has a low pommel, whilst fistulous withers cases usually have high withers.]

Quittor, if treated by a method which does not damage the hoof wall, is usually curable in 3–4 weeks: such cases are fit for further service. Biters and kickers should be cast.

Dermatocoptic and dermatophagic mange seem to have been prevalent. The former was treated by gas therapy [presumably SO_3 application in specially constructed boxes leaving only the face outside] and the latter by rubbing in liquid paraffin (repeat two-three times at four-five day intervals). In neither case were the horses shorn. Lice were treated by applications of nicotine acetate (10 per cent. in hot water), one-half of the body being done one day and the other half the next, to avoid nicotine poisoning.

It is said that 11,000 horses passed through hospital No. 12. Horses were seldom kept for more than three months under treatment.

Müller concludes by emphasising that veterinary hospital personnel, to be efficient, must be skilled in the veterinary art and also in horsemastership.

J. E.

REPORT

[CEYLON.—Administration Report of the Acting Director of Agriculture, for 1940: Part IV.—Education, Science, and Art (D).]

A short veterinary section is included in this part of the report. Mr. M. Crawford, the Deputy Director of Agriculture (Animal Husbandry) and Government Veterinary Surgeon, acted as the Director of Agriculture from November 11th until the end of the year.

A table is given showing the diseases reported. Foot-and-mouth disease appears to be enzootic but no comment on its occurrence is made. The position regarding rabies is stated to be unsatisfactory. During the year there was a large increase in the number of positive brains examined. The number of stray dogs destroyed was 111,420. The whole island remained free from rinderpest. Bovine tuberculosis would appear to be of rare occurrence as only one case is tabulated.

The laboratory continues to be housed in cramped quarters, and work was largely confined to routine examinations and field investigations. One veterinary research officer and one assistant veterinary surgeon are attached to the laboratory. The work on artificial insemination of cattle was continued; the method is said to be becoming popular.

A quarantine for imported cattle is maintained at Colombo. No cases of rinderpest were discovered.

A table of the stock population shows that there has been an increase in numbers in all classes in spite of an increase in the numbers slaughtered for food.

R. F.

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Apr. 23rd.—Meeting of the Derbyshire Division, N.V.M.A., at Sutton Bonington, 2 p.m. for 2.30 p.m.
Apr. 24th.—Meeting of the Yorkshire Division, N.V.M.A., at Leeds, 3 p.m.
Apr. 24th.—Meeting of the Royal Counties' Division, N.V.M.A., at Reading, 2.30 p.m.
May 4th.—N.V.M.A. Committee Meetings at 36, Gordon Square, W.C.1.
May 5th.—Meeting of Council, N.V.M.A., in London.
May 6th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 2.30 p.m.
May 11th.—R.C.V.S. Animal Management Examination begins.

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REGISTER OF VETERINARY SURGEONS, 1942

The Register for 1942 is now published, but owing to the paper shortage, the Paper Control has allowed only sufficient paper to print half the usual number. It will be impossible, therefore, for the Council to send a free copy to every member with the receipt for his annual fee, as has been the custom in the past. Members who need a copy should write to the Registrar, who will distribute them as far as they will go.

The new Register contains the names of 3,983 members, as compared to 3,855 on the Register for 1941—an increase of 128. The following figures show how the list has increased in recent years:—

1934	...	3,409	1939	...	3,659
1935	...	3,440	1940	...	3,722
1936	...	3,526	1941	...	3,855
1937	...	3,545	1942	...	3,983
1938	...	3,597			

In nine years the Register has grown by 574 names.

The list of persons registered in 1881 as "Existing Practitioners" contains only five names.

In addition to the usual contents of the Register, the Registrar has inserted a list of the members who represent the College on various bodies, has given fuller information concerning the prizes awarded by the Council, and particulars of the Frederick Smith Reversionary Bequest to the College. The appendices contain lists of the officers of the R.A.V.C., the Ministries of Agriculture, the Municipal and Colonial Veterinary Services, and the staffs of the Veterinary Colleges and Research Institutes.

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PROTECTIVE CLOTHING FOR VETERINARY SURGEONS IN SCOTLAND

It is understood that arrangements are being made whereby in future the clothing coupons for veterinary surgeons in Scotland undertaking agricultural practice will be obtainable through the Department of Agriculture for Scotland, Edinburgh.

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R.C.V.S. OBITUARY

Goodall, Eric Walter, Hill Crest, South Street, Midhurst, Sussex. Graduated London, December 18th, 1936. Died March 29th, 1942; aged 28 years.

Walker, James Pollock, Tyne House, Haddington, East Lothian. Graduated Edinburgh, July 19th, 1926. Died March 6th, 1942; aged 37 years.

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PERSONAL

Colonial Service Appointment.—Among the recent first appointments announced by the Colonial Office is that of Mr. W. S. Luke, M.R.C.V.S., in the Colonial Veterinary Service, as Veterinary Officer, Kenya.

. . . . .

Birth.—On April 12th, 1942, at Montcalm Nursing Home, Keighley, to Doreen A. Adams (*née* Prentice), wife of Arthur J. Adams, B.Sc., M.R.C.V.S., a daughter.

THE TUBERCULIN TEST

"Decision on Results should rest with Veterinary Surgeon"

Changes in the method of tuberculin testing were urged at a meeting of the Scottish Association of Certified and T.T. Milk Producers.

It was stated that in conjunction with the English T.T. Association and various breed societies several meetings had taken place in London. At these meetings emphasis had been laid on the fact that no change in the tuberculin used should be made in future without prior consultation with herd owners, and that arrangements should be made whereby the veterinary surgeon carrying out the test should be empowered to give a decision on its results.

A further meeting with the Joint Tuberculosis Committee is to be held shortly, and Dr. Chalmers Watson, who is the Association's representative, has been instructed to report back to the executive.—*Farmers' Weekly.*

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RATIONS FOR URBAN HORSES

New ration cards for urban and industrial horses covering the rationing period which begins on May 1st have been issued and application forms have been sent to horse-keepers who received ration cards from the Ministry of Food for the winter period. Anyone whose horses are not rationed by the County War Agricultural Executive Committee or a Department of Agriculture, and who has horses employed on essential transport work but who has not received a form should immediately apply for one at his local Food Office.

Rations will only be issued to horses engaged on work of national importance; they will not be issued, for example, for riding or carriage horses, except in the case of doctors or veterinary surgeons where necessary for their practice. Hay and straw are not rationed.

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ECONOMY IN THE USE OF BACTERICIDES

Memorandum by the Therapeutic Requirements Committee of the Medical Research Council

Following is the text of a statement recently issued by the Therapeutics Requirements Committee of the Medical Research Council:—

The present position regarding supplies of materials used as bactericides and disinfectants is such that every economy must be effected. In the national interest it is necessary not only to select those materials which are most readily available, but also to reduce the total consumption. Large quantities of disinfectants are used in hospital and private practice under conditions in which they are not likely to be effective. Unless efficient mechanical cleansing of utensils which have contained infected material is carried out, subsequent treatment with a disinfectant may be useless. Sterilisation by heat is always preferable to the use of disinfectants and should be employed whenever practicable. Two usual types of disinfectants are the mercurial compounds and the phenolic group, Mercury has to be imported and it is in heavy demand for the manufacture of munitions. We must therefore rely mainly on the indigenous coal-tar disinfectants. Phenol itself, and certain of the constituents of Cresol, B.P., which is the basis of disinfectants of the lysol type, are urgently wanted for the manufacture of plastics used in aircraft construction. There is, however, no reason to fear any shortage of disinfectants provided the more highly purified substances are not used for purposes for which the crude materials would suffice, and provided the coal-tar disinfectants are replaced, where possible, for special purposes by disinfectants such as formaldehyde, hypochlorites and chlorinated lime.

It would be in the national interest if phenol and cresol could disappear as completely as possible from medical practice. For general disinfection the use of cresol with soap solutions, of the lysol type, should be reduced to a minimum and replaced by the cruder disinfectants of the "black fluid" or "white fluid" type, or for certain purposes by chlorinated lime. The same is true of the chlorinated phenols, for though they are highly efficient for special purposes, such as disinfection of the skin, it is wasteful to use them where the cruder disinfectants can be employed. M.R.C. War Memorandum No. 6—Prevention of Hospital Infection of Wounds—Appendix C—contains details regarding the use of disinfectants of the phenolic type for various purposes, and the recommendations which follow are partly based on the information there given.

Recommendations

In general, bactericides should not be used when disinfection by heat is possible. Heat treatment is more efficient and

reliable. Infected matter should be removed, with all due precautions, by scrubbing and scouring, where practicable.

Storage of instruments and suture needles.—These may be kept in liquor boracis et formaldehydi N.W.F. and rinsed with sterile water before use. This method should not be used for hypodermic needles.

Rubber Tubing.—This should be sterilised by boiling at the time of using. If it is thought necessary to keep sterile tubing ready, it can be autoclaved and kept in a sterile towel.

Rubber Sheeting.—Scrubbing with soap and water is all that is necessary unless the sheeting is known to be contaminated in an exceptional way. Heavily contaminated sheeting should be scrubbed and then boiled or autoclaved; if this is impossible it should be scrubbed and sponged over with rag soaked in lysol (½ fl. oz. to 1 pint of water) and then rinsed thoroughly with tap water.

Linen.—This should be boiled if possible, otherwise it should be soaked overnight in a dilution of a "white fluid" disinfectant having a Chick-Martin coefficient not lower than 3·0 (1 fl. oz. to 1 pail of water is usually strong enough with a good "white fluid."

Baths.—Lysol, undiluted, should be rubbed thoroughly over the surface, using a mop or rag in a gloved hand, for at least one minute. The bath should then be washed well with tap water.

Other surgical utensils—arm-baths, bowls, dishes, etc.—These should be boiled whenever possible, otherwise they should be disinfected as for baths, and washed finally with sterile water.

Excreta.—When direct disinfection of excreta is necessary a "black" or "white" fluid, having a Chick-Martin coefficient not lower than 3·0, should be used in accordance with the instructions issued by the manufacturer (1 fl. oz. to 2 quarts of water is usually advisable).

Sinks; Drains.—Thorough flushing is most important. Chlorinated lime is a cheap and efficient disinfectant. Washing soda, 1 oz. to 1 quart of hot water, may be used for cleansing glazed earthenware. A "black fluid," 1 fl. oz. to 1 pail of water, may be used as a deodorant.

Floors.—As a deodorant a "black fluid," ½ fl. oz. to 1 pail of soapy water, may be used. For local pollution a "white fluid" or a "black fluid," 4 fl. oz. to 1 pint, should be used.

PHENOL ANTISEPTICS

Black fluids and White fluids are emulsions of phenolic substances. For most purposes "black" and "white" fluids, if of the same efficiency as judged by the Chick-Martin coefficient, are equally suitable. The tendency of "black" fluids to cause staining, however, may be a disadvantage in some cases.

Black Fluids.—The British Disinfectant Manufacturers' Association state that the following British proprietary disinfectants are of the "black fluid" type:—

Antifect, Bactocene, Coetas, Disolite, Exenol Superior, Hycol, Hygenol Fluid Disinfectant, Ialine Special, Jeyes Fluid, Killcrobe 10/12 Black; Killgerm 10/12 Black, Lawes, Metro, Monsanto Black Disinfectant No. 4, Sanitas-Bactox, Septol, Special Creitas, Cooper's Standard Fluid, Vitalin No. 99.

White Fluids.—The British Disinfectant Manufacturers' Association state that the following British proprietary disinfectants are of the "white fluid" type:—

Baxol X, Botazone No. 1, Exenol D.A. White, Ialine No. 8, Izal, Jeyes White Cyllin, Killcrobe 18/20 White, Killgerm 18/20 White, Lawes L.W.4, Monsanto White Disinfectant Fluid No. 1, Sanitasokol, Sal-Hycol, Star White, Sterilite, Superlin White, White Bactocene, White Kerol, White Septo, Wright's Vetersol, Voxsan M.A.F. Disinfectant Fluid.

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MINISTRY OF AGRICULTURE NEWS SERVICE

STERILITY IN CATTLE: SUGGESTIONS FOR ITS CONTROL

Accurate breeding records, early examination of suspect animals, and treatment when necessary, are the keys to a successful control of sterility in cattle. Expert veterinary advice should be sought at once if the cows return to the bull three or more times, fail to come on heat at the correct time, retain afterbirth or show discharge after calving. The occurrence of abortions, and the period at which they took place, should be noted, and the information given to the veterinary surgeon. The bull's service record is another important consideration. It should not be forgotten that improper feeding and general management of the herd, especially during the winter, may contribute to sterility.

Surplus Carrots Help the Condition of Weakling Pigs.—Chopped carrots form an excellent supplement to the ration of young pigs. In a recent experiment carried out at Wye Agricultural College, the groups receiving ½ lb. of carrots per head per day in addition to the basic meal ration, did consistently better than those without carrots.

Carrots, it appears, have a particularly beneficial influence on weakly piglings, of which there were four in each group. Those without the carrot ration were unthrifty at the end of the trial, but the others had recovered their condition.

Observations were also made on the good effects of feeding ½ lb. of chopped carrots a day before weaning, but it was found inadvisable to exceed that quantity with piglings between 6 and 8 weeks old.

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LADIES' EFFORT FOR BENEVOLENCE

The ladies of the North of England Veterinary Medical Association have raised the sum of £25 for the Victoria Veterinary Benevolent Fund by a "bring-and-buy" sale and tea. This was held on the occasion of the Annual General Meeting of the Division on March 27th, 1942.

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"STUDENTS IN UNIFORM?"

Much that, we cannot help feeling, must in like manner be disturbing the minds of many veterinary students finds expression in the following leading article published under the above heading in the *British Medical Journal* (February 28th, 1942). The lines suggested to be followed that would give peace of mind to the student during his course of studies are worthy of notice from our own educational authorities.

"Young men are rightly touchy when they fancy themselves suspected of evading military service; and most are their own sternest critics in this direction. In the last war medical students were spared the ordeal of examining their motives because they were called up as soon as they were of an age to serve—a policy which led to a serious falling off in the numbers qualifying. In this war, since April, 1941, all medical and dental students have been reserved from the date of their acceptance by a recognised medical school, each school having to keep its admissions within an allotted quota. This throws the responsibility for choosing between military service and a reserved occupation on the senior schoolboy or his parents. Many of the more enterprising boys and more public-spirited parents no doubt take the short-term view that immediate action in a fighting service is more valuable to the country than a promise of action as a doctor several years hence. Fortunately for the post-war profession this view has not so far led to a fall either in numbers or quality of the applicants for at any rate the larger medical schools, but a peripatetic correspondent suggests that the exempted student's work suffers from the constant nagging of his conscience and of white-feather friends. The difficulty would, he thinks, be overcome if all medical students were called up on reaching military age and then sent back in uniform to complete their medical training. The uniform itself is but a minor part of the proposal, though it should offer better protection from white feathers than the badge for the buttonhole which some medical schools now supply. For the newly qualified man there is already no problem: the Central Medical War Committee sends him where it thinks him most useful—and our correspondent is urging that it would set the student's mind at rest, and ensure our profession a fair share of good men, if students were equally bereft of choice, once they were well along the road to qualification. By the time they reach 18½, the calling-up age, most medical students have passed their pre-medical examinations and entered on the pre-clinical years. They are then no longer entitled to be extravagant with their persons, and the country has a fair claim on their future service as doctors. Certainly the young man who has gone from school to medicine and sees every prospect of qualifying need feel no prickings of conscience if he decides to keep on with his studies, for there are no cushy jobs these days."

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CLYDESDALE HORSE SOCIETY

In the course of the report of the Council of the Clydesdale Horse Society, presented to the 65th annual general meeting held at Glasgow on March 4th, it is stated that not since the boom years towards the end of the last war has the demand for draught horses been so keen and sustained with an upward trend in values which at times can only be described as phenomenal. At the various auction sales held throughout the year, says the report, the number of Clydesdales selling at prices running into three figures numbered over 300, and all classes participated in the general improvement.

The report continues: "While this position may be gratifying to breeders, it indicates that the supply of animals is insufficient

to meet the demand, and as that demand is certain to expand in the future, breeders would be well advised to give thought to this section of their activities. Indications at present point to a strong demand both for home and overseas needs when the world returns to normal, and the staunch supporters of the breed who continue to keep faith in the future will be the parties in a position to reap the reward of their foresight."

The report expresses satisfaction at the renewal of the scheme of assistance for heavy horse breeding in Scotland.

The Society elected Professor John R. McCall, M.R.C.V.S., Glasgow, as its President for the ensuing year.

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"M.R.C.V.S."

In an entertaining style well suited to his medium, a veterinarian contributor to one of our popular magazines, under the above heading, makes some shrewd observations on some aspects of his calling, in the course of recommending its readers to make an addition to their library list.

"A very pretty compliment," he writes, "is paid to my profession by the author of *A Cottage in the Country*, newly issued from the offices of *Country Life*. The author, Reginald Arkell, advises the newcomer to lose no time in making friends with the local veterinary surgeon. 'Scratch up an acquaintance with him and you will soon know the district better than the man who drew the ordnance map. You will find him more interesting than the ordinary countryman. In his youth he has seen cities and his interests are wider than his neighbours'. He is, for instance, a specialist on many subjects outside his own profession. He can talk with authority on trees, birds, and the habits of wild animals. The farmer knows a lot about a little; writers on the country sometimes know a little about a lot; but the Vet., because of his training and experience, has a knowledge of rural England that is both accurate and extensive.'

"Let us consider," our colleague proceeds, "a little more closely the implication of these five mystic letters, each representing a year of concentrated study. What do they mean? Member of the Royal College of Veterinary Surgeons, not Member of the Royal Veterinary College: which doesn't fit any way, though a lot of people try to read them so." He then proceeds to make reference to our teaching colleges and one portal system of entry, and continues: "Although surgery is the only subject mentioned in the title, the course also includes very complete instruction in medicine and a whole gamut of other subjects, and the title may be considered practically equivalent to the combined M.R.C.S.-L.R.C.P. degrees in Medicine, except that the sister profession is lucky in having only to deal with one species of animal (*H. Sapiens*?) whereas the poor old Vet has horse, ox, sheep, pig, dog, cat, and poultry of all shapes, sizes, and breeds; these as quite normal routine, though some clients seem to think we can put life into a dodo or de-constrict a boa. The colonial services also carry a little extra weight in the shape of elephants and that beloved animal the camel."

An age-old controversy within the profession itself is dealt with as follows: "By the way, I notice that I have occasionally used the abbreviated 'Vet': this in the eyes of our purists is a grave offence; 'Veterinary' apparently should be used whole, with the second syllable accentuated as in midwifery. The whole word suitably accentuated and *rrrrd* is of course a gift for the Scotch after-dinner speaker, but the poor Southron often seems a little uneasy. And after all, why should Vet be despised? To 'vet' anything has become an almost universal expression signifving anything 'thoroughly and honestly tested.' It is so used in the Law Courts, House of Commons, and other seats of the mighty, and, I think, may be taken as a term of approval, not the reverse. And again, having successfully completed the five years very hard labour and obtained the title, would you rather be labelled 'Vet' or would you prefer one of the fearful abortions one gets daily? Vetinary is probably the commonest and is frequently used even by schools and others who ought to know better; Vetrinary, Vitinary, Vetrinery, and other astonishingly ingenious variations are by no means uncommon.

"And now, my dear Editor," concludes the author, "if, by any stretch of imagination, alteration, purgation, or what you will, you think this of any interest, carry on; but please remember: we must not contravene By-law 1, Sect. 6, V.S. Act 1881, 44 and 45 Vict., Chap. 62, etc., etc., *ad inf.*, 'by advertising or causing or permitting other persons to advertise for him, whether by paid advertisement or by editorial or other notice in the public press,' etc., etc., once more *ad inf.*, or we shall both be H.D. and Q."

PROPHYLAXIS OF GAS GANGRENE

Experiments with various sulphonamide preparations show that gas gangrene can be prevented by their introduction into the pockets of wounds. Tests were made with six different products—including mesudin, described as a secret preparation of the I.G., recently named marfinal—by inserting a quantity of the sulphonamide into the cut muscle of an animal together with a constant quantity of experimental earth containing gas-gangrene organisms. It was found that treatment must not be postponed for more than nine hours. It is assumed that both locally and through absorption the sulphonamides act on the gas-gangrene organisms.—(*Klin. Wschr.*, 1942, **21**, 14, quoted by *Pharm. J.*).

CORRESPONDENCE

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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"CASE FOR DIAGNOSIS"

To the Editor of the Veterinary Record

Sir,—Whenever a calf which is still on a milk diet is given to drink a large quantity of *cold water* the urine very soon becomes red coloured through fresh blood; often within a quarter of an hour.

We used to demonstrate this to the students at the Faculty for Veterinary Medicine of the University of Utrecht. There was some difference in the intensity of reaction between the calves, but they did not suffer long from it as a rule and we never lost any under the symptoms described by R. H. Smythe in your issue of March 28th. The water used was drawn straight from a cold water tap outside the clinic after letting the tap run for a while.

At slaughter houses where many milk-fattened calves are killed it is a usual thing to find kidneys full of fresh haemorrhages. This is usually explained as the effect of the killing, like the petechiae on the epicardium. However, several veterinarians attribute some of the cases at least to the fact that these calves, arriving thirsty, drink a lot of *cold water* previous to being killed.

Although this information does not explain anything, it may have a bearing on the case.

Yours sincerely,
TJ. Bakker.

45, The Gardens,
Watford,
Herts.
April 8th, 1942.

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TOWARDS *OUR* "NEW ORDER"

To the Editor of the Veterinary Record

Sir,—In studying what Mr. Thos. A. Dobie, in your issue of November 15th, 1941, calls the Crosfield-McCunn correspondence, I observe an omission from the premises in all the arguments of reference to a factor which should not be overlooked in a scientific journal. That is the ruling factor of all—so far as Anglo-Saxons in general and Englishmen in particular are concerned—the wholly insufficient birth-rate.

Those who, like Professor McCunn and Mr. Dobie, look forward to some return to the delights of private enterprise, evidently ignore the fact that this involves, more or less, a return to the social conditions that brought the birth-rate of England and Wales down to less than 14 per thousand of population before this war and to some lower level during the war. And those who deny that a revolution is taking place or will take place in Britain, or that a revolution is necessary to save Britain, must tell us by what other means short of social revolution the Anglo-Saxon is to be induced to breed sufficiently to resist ultimate conquest by more philoprogenitive and less sophisticated races. Until this problem is solved social planning for the future of Anglo-Saxon communities is largely a waste of energy.

In my prolonged sojourning in several English-speaking countries I have observed that everywhere, except in quite primitive rural areas, the birth-rate of Anglo-Saxons has fallen or is falling below replacement level. In this respect the pace is set by England and it is for you in England to discover how to restore a sufficient degree of fertility to the English people before you accept as your social goal a return to private enterprise.

Yours faithfully,
J. W. Rainey.

79, Stewart Street,
Devonport,
Tasmania.
January 15th, 1942.